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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Russians in Antarctica

See Page 373

A SCIENCE SERVICE PUBLICATION

How to Be Incredibly Cool All Next Summer

Can you remember breathless nights last summer when you vowed you'd pay anything for a good night's sleep?

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MEDICINE

Dateline: AMA, New York

When doctors gather, all medical fields are discussed. Highlights of the annual meeting of the American Medical Association are reported on the following pages.

At a time when the public is being confronted almost daily with statements and statistics on the dangers of smoking, while cigarette manufacturers work on developing "safer cigarettes," doctors at the AMA meeting learned the results of an extensive study of male smokers.

➤ HEAVY cigarette smokers die seven to eight years before they normally would if they did not smoke, Drs. E. Cuyler Hammond and Daniel Horn, American Cancer Society, reported at the AMA's New York meeting.

This ominous finding plus the fact cigarette smoking must now be considered an important factor in coronary disease, the nation's number one killer, were included in the final results of a 44-month study of 188 000 men between 50 and 70 years old made by the American Cancer Society.

Smoking definitely does cause lung cancer, Dr. Hammond said, and it is "associated" with coronary artery disease as well as other types of cancer and lung disease.

Lung cancer death rates were 1,000% higher among regular cigarette smokers than among non-smokers.

The most important finding of this final part of the survey was what happens to smokers who decide to quit the habit: If they do, their chances of getting lung cancer drop about in half.

The figures showed light smokers quit the habit or cut down much more than heavy smokers do. Of the regular smokers at the end of the survey, 28% reported using filter tips. Since the survey began, 11,870 have died. Of these, 4,406 had smoked cigarettes regularly. If they had the death rate of non-smokers, only 2,623 would have died.

Coronary artery disease accounted for 52.1% of all the 2,665 "excess deaths" among men with a history of regular cigarette smoking, and other heart and circulatory diseases added another 5.8%.

Death rates from all causes combined rise with the number of cigarettes smoked daily. Compared to non-smokers, the death rate was 34% higher for those who smoke up to half a pack a day, 70% higher for one-half to one pack a day, 96% higher for one to two packs a day, and 123% higher for two or more packs a day.

Infertility and Diet

➤ THERE ARE no food cures for infertility, Dr. M. Edwards Davis, University of Chicago School of Medicine, reported to the AMA.

Debunking the current fads for various diet supplements to help overcome infertility, Dr. Davis said the average American receives a reasonably good diet and does not benefit from the added vitamins and minerals that are offered as fertility aids.

Fruits and fruit juices have most recently been suggested as the cure for infertility but this claim still lacks sufficient scientific proof to back it up.

Another diet supplement that has been widely heralded is vitamin E. Although it has been shown to work in rodents, proof of its effect in man is on much shakier ground, the gynecologist reported.

But good overall nutrition does play an important role in infertility. Studies of teen-agers who are not concerned with their diets and who put on excess weight during adolescence have shown that their reproductive organs are noticeably delayed in reaching full maturity.

On the other hand, if too much weight is lost, fertility can be seriously lowered or even lost.

Victims of wartime concentration camps who lost one-third of their total weight became completely infertile during the time they were undernourished. When rescued and properly fed, however, their fertility returned to normal within six months to two years, Dr. Davis said.

Extreme weight loss probably decreases fertility by diminishing the activity of the pituitary, the body's master gland. This gland, in turn, then fails to stimulate the activity of the sex glands as it normally does.

Heart Cases Re-employed

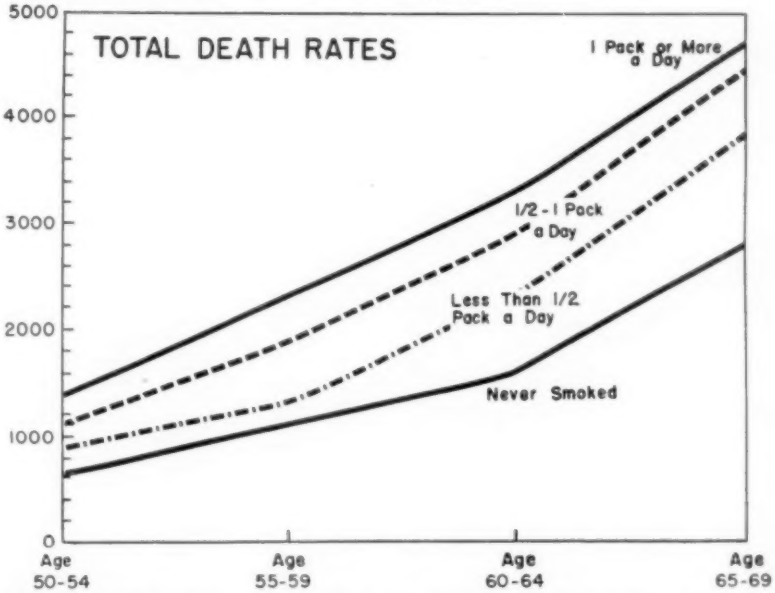
➤ THE ENCOURAGING results of a three-year study of 15,000 employees in medium industry show 95% of heart cases who return to work can go back to their old jobs as they were or with only slight modifications.

Only five percent of the heart cases had to return to a completely new type of job, Drs. J. J. Thorpe, assistant medical director, Esso Standard Oil Company, New York, and Neill K. Weaver, Esso refinery medical director, Baton Rouge, La., reported to the AMA.

Out of the 15,000 petroleum industry employees studied, 600 had some type of heart disease, including heart attacks, hardening of the arteries, anginal pains or strokes. In the heart attack group, 76% of those who survived were able to return to work.

Probably the most important finding of the long-range study is the large number of returning workers who are able to go back to essentially the same job.

Another finding is that increasing age was not as constant a factor in work stoppage as had been supposed. Considerably less of the 45 to 49 age group returned to work than did those who were either older or younger.



DEATH RATE—The annual death rate per 100,000 population is shown for men with a history of regular smoking only. The rate is by the number of cigarettes smoked per day.

Of the total 600 cases, approximately three-fourths of them had arteriosclerosis or hardening of the arteries. The others had either high blood pressure disease or suffered strokes.

Of those who had angina, or coronary insufficiency, 83% returned to work. Among the congestive heart failure cases, where the heart is pumping insufficient blood, 76% returned to work.

Stroke victims were absent from work an average nine weeks and 47% of these cases eventually returned.

Sex Hormone Treatment

➤ THE SUCCESS of a new male-female sex hormone treatment for enlarged prostate glands in men was reported by Drs. Joseph J. Kaufman and Willard E. Goodwin, University of California Medical School, Los Angeles, to the medical association's meeting.

Prostatic enlargement creates painful symptoms, including the inability to urinate. Non-cancerous enlargement is a relatively common condition in elderly men. Occasionally a benign growth may later become cancerous and therefore the condition must be carefully watched.

The preferred treatment for it is removal of the gland, but in many cases surgical removal is either unwanted or unwise because of advanced age.

It is supposed the swollen condition is due to too much of the sex hormone estrogen and not enough androgen. The male hormone testosterone promotes normal and cancerous prostatic growth, while estrogen in some cases directly inhibits the growth of prostatic cancer, the doctors reported.

To test the hormonal imbalance theory, 44 patients with swollen prostate glands were given combined androgen-estrogen injections for six months. Three injections per week were given and the ratio of androgen to estrogen was 20 to one.

The majority of the patients improved after the treatment and in one-third of the cases there seemed to be reduction in the size of the gland. Half of the cases showed cellular changes in the gland structure. The changes, however, were too small and unpredictable to be conclusive at present.

The doctors plan further studies with oral preparations of the hormone combination. They believe this type of medical treatment may give symptomatic relief to the condition.

Oral Drug for Diabetics

➤ A DIABETIC drug that can be taken by mouth to replace or supplement insulin injections was revealed to the American Medical Association's annual meeting.

The compound, called DBI for short, has proved to be a potent agent in reducing blood sugar level, Drs. Julius Pomeranze, G. J. Mouratoff and Herley Fujiy, New York Medical College and Bird S. Coler Hospital, New York, reported.

DBI, known technically as N'betaphenethylformamidinyliminourea, is active in either mild or severe cases of diabetes.

Sugar tolerance tests suggest part of the drug's action may be due to an increased use of sugar in the outlying areas of the body, Dr. Pomeranze told the American Diabetes Association meeting concurrently with the AMA.

In some cases of diabetes, the new oral drug cannot completely replace insulin, but it can cut down the amount needed. Three severe young diabetic patients had their insulin dosage cut by 25% to 50% while receiving daily amounts of DBI by mouth. All of them had previously required over 50 units of long-acting insulin per day.

DBI has proved to be active in all types of diabetes, and is of "profound interest" academically. Further clinical trials in humans are needed.

Unlike other oral insulin replacements now being studied, DBI is fully active in animals made diabetic by destroying their insulin-producing gland, the pancreas, Dr. Louis Freedman of the U. S. Vitamin Corporation, producers of DBI, reported to the doctors.

It is therefore probable DBI and related compounds can act in the absence of insulin.

The drug still has some unwanted side effects such as nausea and diarrhea, but these show up only when it is given in relatively large doses.

Only limited supplies are now available, Dr. Freedman said, and many more months of human and animal research will be needed for perfecting the drug.

Fractures Go Undetected

➤ BROKEN BONES are being left untreated because doctors are depending too much on what their X-ray pictures tell them, Drs. Norman J. Rosenberg and Rudolph S. Reich, Cleveland, Ohio, reported to the American Medical Association meeting in New York.

Even with the new X-ray materials and methods there are many so-called "occult" fractures of bone that do not show up in X-ray examinations, but they are there just the same.

These can occur in almost any bone in the body and cause considerable pain, anxiety, disability and expense. Medically, they are defined as fractures that give clinical signs of their presence, such as pain and immobility, but cannot be demonstrated by X-rays until after healing changes have occurred.

Unfortunately, these healing changes often extend into ligaments and other soft tissues and begin to harden them like bone. This is especially true of occult fractures in the foot and ankle.

Occult fractures have been known to exist for a long time, but instead of this improving treatment, it has only afforded security to the doctor who receives a negative report from the X-ray department and accepts it as conclusive.

The most common occult fractures are those of the radius, the smaller of the two bones in the forearm. These occur many times in children as a result of falling on outstretched arms.

The plaster cast treatment should always be used in these cases but a cast has been so closely associated with the treatment of fractures that doctors are reluctant to apply one without documentary evidence of the break.

"Let us not be in the position of treating the X-ray while we ignore the patient," they advised their fellow physicians.

(Continued on page 382)

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METEOROLOGY

Project Skyfire Aimed at Stopping Lightning Fires

➤ PROJECT SKYFIRE, a joint venture of foresters and weathermen, starts its first full season of operation this June, with field experiments being conducted in Idaho and Montana.

The project's aim is to cut down on lightning-caused forest fires by cloud seeding. In the West, 49% of forest fires result from lightning.

The scientists will heavily seed supercooled clouds, composed of water droplets below freezing temperature, with silver iodide to cause the droplets to change to ice. They hope large doses of the chemical will inhibit the clouds' upward growth, a growth that is necessary before lightning occurs.

Preliminary tests of equipment, including radar to detect and track lightning storms, were made last summer.

Cooperating in Project Skyfire experiments are U. S. Department of Agriculture's Forest Service, Munitalp Foundation, U. S. Weather Bureau, Montana State University, University of Washington, National Park Service and California State Division of Forestry.

Previous studies have shown 100 000 lightning fires occurred from 1940 to 1955 in 12 states in the Rocky Mountains and Pacific Coast area. If the information gathered this summer shows the method is feasible, the technique will be considered for other areas.

Since little natural rainfall occurs along with lightning storms in the West, seeding clouds is not expected to reduce the total amount of precipitation.

Science News Letter, June 15, 1957

GEOPHYSICS

Russia Pushes Into Antarctica

See Front Cover

➤ THE RUSSIANS in Antarctica are currently at work establishing inland bases on their way to the "Pole of Inaccessibility"—the area between the South Pole and South America. In this part of the white continent there is a land area equal to half of Europe unseen and unexplored.

Tractor trains, loaded with prefabs, scientific gear, power and radio stations, fuel and food have left the main base at Mirny for inland. The photograph on the cover of this week's SCIENCE NEWS LETTER, believed to be the first of the Russians in Antarctica published in the United States, shows two expedition members erecting telephone wires at the Mirny base.

Stations in the planning stage include the Vostok station, with 12 scientists under V. Avervanov, at the geomagnetic pole 930 miles south of Mirny, and the Sovietskaya station, with 10 scientists under S. Kartashov.

Science News Letter, June 15, 1957

LIGHTNING STRIKES—In the western United States valuable mountain forests are destroyed each year by lightning fires. In the Arizona-New Mexico area 79% to 84% of all forest fires are caused by lightning, with the Idaho-Montana area running a close second with 69% to 71% of all fires being lightning-caused.

AGRICULTURE

Growth Promoters Found

➤ SUBSTANCES rivaling the gibberellins, compounds that cause plants to grow like Jack's beanstalk, have now been found in seven different families of flowering plants. These include beans, peas, plums, apricots, avocados and the English walnut. A team of scientists from the University of California at Los Angeles reported on the research to the National Academy of Sciences in Washington.

The "gibberellin-like" substances found in extracts from the seeds and fruit of the seven families of flowering plants produce the same growth response in maize dwarfs as do the known gibberellins. The maize dwarfs treated with the substances grew as much as 400% over the untreated control plants.

The results of the study, the California scientists say, suggest the widespread occurrence in flowering plants of substances having growth-promoting properties similar to the known gibberellins. Gibberellins, which have received wide publicity recently as growth promoters, are products of certain strains of the imperfect stage of the fungus *Gibberella fujikuroi*, a serious disease of rice plants in Japan. (See SNL, May 18, p. 314.) Studies of the gibberellins indicate that they have many different effects on plants aside from stimulating plant growth. They can cause earlier flowering, faster germination, change the shape of leaves, and increase the amount of fruit produced.

Just how close chemically the "gibberellin-like" substances are to gibberellins themselves will require more research data.

The research team of Dr. Bernard O. Phinney, Dr. Charles A. West, Mary Ritzel and Peter M. Neely of UCLA's departments of botany and chemistry conclude:

1. Extracts from nine genera representing seven different families of flowering plants give a "gibberellin-like" response in dwarf maize plants.

2. Five genetically different dwarf mutants of maize respond both to the gibberellins produced by the fungus *Gibberella fujikuroi* and to the "gibberellin-like" substances obtained from the seed or fruit of flowering plants. Four other dwarf mutants respond only slightly in the seedling stage to the gibberellins and to the "gibberellin-like" substances. Another mutant, dominant-dwarf, gives no growth response to the gibberellins or to the "gibberellin-like" substances.

3. The structural response in the tested plants was the same for both groups of growth promoters.

4. The study suggests the "gibberellin-like" substances are not chemically identical with the known gibberellins and there may be a number of "gibberellin-like" substances present in flowering plants.

The study was reported in the *Proceedings of the National Academy of Sciences* (May).

Science News Letter, June 15, 1957

MEDICINE

Radiation Sickness Pill

While scientists and the public alike debate the dangers of radiation, scientists have developed a pill that may protect the individual against these dangers.

➤ A PILL for humans to swallow and protect themselves from death by radiation is being developed, Dr. R. R. Overman, College of Medicine, University of Tennessee, Memphis, has told SCIENCE SERVICE.

The protective chemical that may be used in it, called AET, has already been found to be 100% effective in mice exposed to lethal doses of radiation, and is now reported to be effective in monkeys. Human trials are underway.

The results of the latest experiments in monkeys with AET were reported by Drs. B. G. Crouch and Overman of the University, in the journal *Science* (May 31). The monkeys were given increasing doses of AET by injection, then subjected to a lethal dose of X-rays. After receiving the X-ray dose their blood counts dropped but began their climb back up toward normal after 18 days. Their blood was completely normal by 65 days.

The big problem with the compound is that it is almost immediately excreted by the kidneys, said Dr. Overman. It is quite likely that a way will be found to prevent this, though, he added.

Experiments have shown the full protective dosage can be given orally and still be effective, so the problem now is finding a way to keep a high level of it in the body tissues over an extended period.

One way to accomplish this would be in a pill made to dissolve very slowly and keep up a certain level of the compound in the body.

Scientists at Oak Ridge have made the drug itself radioactive in order to trace its course through the body. They have found that it concentrates in bone marrow, intestinal mucosa and lymphoid tissue, which are the primary sites of radiation damage. in animals and man.

Preliminary studies of the drug in humans are now going on, to determine how toxic it is. So far, it has been found nontoxic but only a fraction of the amount given to monkeys has yet been tried in humans, Dr. Overman said.

Oral doses of the drug are not nearly as toxic as injections of it, although only injections have been used in humans so far.

Plans are underway to prepare for an actual test in humans if and when there is any kind of an atomic accident requiring persons to enter a highly radioactive area.

AET's full name is S2, B-amino-ethylisothiuronium—Br—HBr and it is cheap and easy to produce.

Our problem now is to get the pharmaceutical industry interested in the drug, since they have the technical know-how for developing a lasting type of oral preparation, Dr. Overman said.

At the present time two pharmaceutical companies are working with the drug and plan to produce it for researchers. It was originally developed as a radioprotective compound by Drs. D. G. Doherty and Ray Shapira, Oak Ridge National Laboratory, Oak Ridge, Tenn., he said.

Science News Letter, June 15, 1957

PUBLIC HEALTH

"Clean" Nuclear Weapons

➤ THERE IS NO such thing as a "clean" nuclear weapon, Dr. Alvin C. Graves, test director for the Atomic Energy Commission's Los Alamos Scientific Laboratory, reported to the special subcommittee on radiation of the Joint Congressional Committee on Radiation.

Dr. Graves, recovered victim of the famous "screw driver" atomic accident at Los Alamos in 1946, told subcommittee members radiation contamination from a nuclear explosion is inevitable in bombs using the fission process.

Radiation itself is not necessarily a desirable factor in a weapon, but one cannot speak of "clean" or "dirty" bombs in reference to their radiation output. All bombs are "dirty" to some degree, he said.

In 1946, Dr. Graves was one of a small group of scientists working with fissionable material who accidentally received dangerous amounts of radiation.

Dr. Louis Slotin, an associate, lost his life when he accidentally let a screw driver slip from his hand as he was adjusting the distance between amounts of radioactive material. They were brought too close together and all those watching the experiment received heavy doses of gamma radiation. Dr. Slotin received around 800 roentgens, Dr. Graves reported.

The lethal dose is considered to be around 450 roentgens.

Although he was standing only one foot behind Dr. Slotin, Dr. Graves received about 200 roentgens and was hospitalized for two weeks. As a result of the accident he has lost some of the hair on one side of his head and has a radiation cataract in one eye.

When asked whether the accident had any effect on his ability to "increase his family," Dr. Graves replied he had had one child before the accident and since then has had two more.

➤ OTHER SCIENTISTS testifying before the Congressional subcommittee warned there is no such thing as a "safe" dose of radioactive fallout.

Dr. James F. Crow, genetics professor at the University of Wisconsin and a member of the National Academy of Sciences' committee on the genetic effects of radiation, said that if the present rates of testing atomic and hydrogen bombs continue, "we can be sure hundreds or thousands or tens of thousands or perhaps more persons will be diseased or deformed or die prematurely as a consequence of the fallout."

One of the dangers from fallout, the scientist emphasized, is the unknown total of minor mutations produced. These mutations tend to remain in the population for long periods of time since they are not severe enough to cause death or "gross genetic disease." Many cannot even be detected. The minor mutations can increase a person's susceptibility to disease and generally lower his life span.

Most information on radiation fallout doses is based on studies of a combination "man-mouse-fruit fly," with most research done on the mouse and the fruit fly, Dr. Bentley Glass, genetics professor at Johns Hopkins University, said. Because of this, he pointed out, the NAS committee's estimate of the maximum permissible radiation dose may have to be lowered. Recent experiments indicate radiation has a greater effect on man than it has on flies and mice.

Dr. Glass said he had heard a "rumor" that cesium-137, a fission product present in fallout, has a tendency to deposit in the reproductive organs when it is taken into the body. This means a further genetic danger in fallout may exist. Strontium-90 and other radioactive chemicals, when taken into the body, appear to harm the bone and other tissue not involved in reproduction.

Dr. Glass said a gradual increase over a number of years in money devoted to research in genetics is necessary. He further recommended that a biological scientist be represented on the Atomic Energy Commission itself along with the physical scientists. At the present time there is a committee of biological scientists advising the AEC.

A Human Question

➤ RADIATION, boon or baleful poisoning of our future? Congressional hearings have been evaluating the differing opinions of scientists and neo-experts.

Here is a case, as often happens in controversies about so-called facts, where there is neither black nor white, but only gradations of truth and implications.

There is little doubt that, in large doses radiation of various sorts, the radiation called ionizing (knocking electrons off of

atoms), is dangerous and in the long run deadly to people and other living things. This is true both for individuals living and for the future generations they beget, even if the results will be far in the future in the case of the hereditary effect.

There is little doubt the world would be a safer place for our children's children if there were less radiation from the testing of atomic bombs. This is a long-term consideration. People may live, on the average, a few days less due to atomic debris. It is more sure that it will affect the generations to come.

The radiation danger is such that no sane rulers mindful of the future of their peoples would begin an extensive atomic war which would poison the atmosphere and the earth.

As the experts testified on Capitol Hill, they talked of different time scales and from different backgrounds. Little danger today can become the high probability of death in the future.

The X-ray specialist does not hesitate to use heavy doses of irradiation or take many X-ray photographs if the patient requires it, although each exposure builds up radiation danger.

However, a more severe limitation of medical radiation than in the past is being urged by the experts.

The point of controversy between the opinions of those who favor and oppose stopping atomic testing is whether future genetic risk is worth the added assurance of atomic preparedness resulting from testing.

It is not so much a scientific question as a human and political judgment.

Science News Letter, June 15, 1957

CONSERVATION

Chemical Cuts Water Loss

At a time when demand for water is growing, a chemical offers a solution to water loss through evaporation, a problem faced by nations throughout the world.

➤ AS MUCH AS 65% of the water lost from the nation's reservoirs and lakes through evaporation might be saved by a chemical shield approximately 20 millionths of an inch thick.

A one-molecule thick coating of the chemical compound hexadecanol on the water's surface has eliminated more than two-thirds of evaporation losses in laboratory experiments conducted by the Department of the Interior's Bureau of Reclamation.

Now, Interior Secretary Fred A. Seaton has announced experiments are under way to see if hexadecanol will work on large water areas.

Rattlesnake Reservoir, near Loveland, Colo., with a surface area of 97 acres or about one-sixth of a square mile, is the site of the experiments.

There the soap flake-like particles of hexadecanol, a chemical compound found in some medicines and cosmetics, will be slowly dispersed on the water surface, forming a film that shields the water from air and sun. Even if it is 20% effective—one-third as good as laboratory results indicate—in cutting losses through evaporation, says W. A. Dexheimer, commissioner of the reclamation bureau, the water savings would be "tremendous."

Each year the nation's reservoirs lose as much as eight feet of water because of the action of wind and sun stealing away molecules of water. While this precious water is literally disappearing into the thin air, our consumption of water grows. It is more than four times what it was in 1900. And by 1975 it is estimated we will be using twice as much as we do today.

The tests of hexadecanol at Rattlesnake Reservoir will give the reclamation scientists the information they need on just how the chemical should be dispensed over the water surface, how long it can be maintained, and how strong the layer is.

Compression of the one molecule thick layer is determined, as illustrated in the photograph below, by the spreading of drops of oil which is graded from 5 to 42 dynes pressure per centimeter. The round, doughnut-shaped container floating near the boat's bow dispenses the flake-like particles of chemical on the water's surface.

Later this summer, if the studies prove effective, full-scale monomolecular layer experiments will be held at Lake Hefner, the main reservoir for Oklahoma City, where actual measurements of reduction in evaporation losses will be made.

Hexadecanol, or cetyl alcohol, does not affect the taste or odor of water and is completely nontoxic to higher animals, the scientists report. It also has "no discernible effects on aquatic life." In one form it is used in detergents.

WATER CONSERVATION—Lloyd O. Timblin, Jr., and Quentin Florey, laboratory physicists with the Bureau of Reclamation, are testing the surface film pressure of hexadecanol on the water at Rattlesnake Reservoir, Colo., by applications of oil.

Research in Australia

Both Australia and South Africa, in addition to private research groups here, have been conducting research on the problem of water loss through evaporation in recent years. (See SNL, December 8, 1956, p. 365.)

In a 14-week test of the effectiveness of a film of cetyl alcohol on the surface of a reservoir, Australians have reported 200,000,000 gallons of water were saved.

At a cost of approximately one penny per thousand gallons, an amount of water equivalent to six-weeks' summer consumption was saved.

W. W. Mansfield, of the industrial chemistry division of the Commonwealth Scientific and Industrial Research Organization, reports this method of conserving water would not exceed five cents per thousand gallons and the cost is much lower than that of other possible methods.

Science News Letter, June 15, 1957

PHYSIOLOGY

Brain Gives Orders to Pituitary Master Gland

➤ ASPIRIN and morphine, which stimulate ACTH production, apparently act on the endocrine system through the brain, two scientists in the University of California School of Medicine have found.

ACTH is the pituitary gland hormone which stimulates the adrenal glands to produce cortisone.

The drugs apparently induce the brain to tell the pituitary gland to step up ACTH production, and the added ACTH makes the adrenals put out more steroid hormones.

The fact that the brain can order the pituitary around is a further bit of evidence weakening the long-held view that the endocrine glands are a self-governing system controlled by the "master" pituitary.

The scientists, Drs. E. L. Way and Robert George, used rats in their experiments.

They tracked down the site of action of the drugs by a process of elimination. They were able to prevent the hormone-stimulating effects of the drugs if they destroyed a point in the brain known as the median eminence.

The two drugs' actions on the pituitary appear to involve transmission of a signal from some area in or near the hypothalamus. This portion of the brain is not fully understood, but is known to influence sleep, appetite and temperature regulation.

The two scientists said further work is needed to explain fully the nervous pathways of aspirin and morphine, and that there may be more than one mechanism for influencing the pituitary.

Science News Letter, June 15, 1957

OCEANOGRAPHY

New Ocean Stream Found Under Gulf Stream

➤ ANOTHER DEEP ocean stream flowing in the opposite direction moves under the Gulf Stream, at least off the South Carolina coast. There, the upper half of the water column moves northward, while the lower half goes southward.

This finding, if proved true for the rest of the Atlantic Ocean from the Arctic to the Antarctic, will mark a revolution in present ideas concerning ocean circulation. The low-lying underwater current flowing southward was discovered in cooperative research by scientists of the British Institute of Oceanography and the Woods Hole Oceanographic Institution, Woods Hole, Mass.

They used the B.I.O.'s 234-foot Discovery II and the Woods Hole 142-foot Atlantis to detect directly the massive deep stream. Its existence was first suggested by Henry Stommel of Woods Hole, who believes the deep southward current is caused by temperature differences.

To test the theory, a British device that measures ocean currents directly was lowered into the water a little to the east of the surface Gulf Stream, which flows northward along the western edge of the Atlantic. Called a "pinger," the device consists of electronic signalling apparatus encased in an aluminum alloy pipe nine feet long and two inches in diameter.

The pinging float can be adjusted to remain at any desired depth, and is then carried along at the same rate and in the same direction as the subsurface current.

After the usual observations of temperature, saltiness and oxygen content of the water from the ocean surface to the bottom were made at stations two miles apart, the expected deep current velocities and directions were computed. Then the pinging floats were set out one at a time and followed for periods ranging from 18 hours to four and a half days.

Loran stations helped the scientists to determine their positions with the extreme accuracy needed.

The direct observations of the deep current by the British confirm Mr. Stommel's prediction of a subsurface stream flowing southward. The current was found to be slowest between depths of 4,500 and 6,000 feet, and to increase steadily in velocity at greater depths, as was predicted.

The southerly current ranged from about 600 to about 2,000 feet per hour at a depth of about 8,400 feet. In contrast, the surface velocity of the Gulf Stream along the narrow inshore edge nearest the United States ranges from about 24,000 to 30,000 feet per hour.

The southward moving lower layer exists only 18 inches from the bottom, the test showed.

The confirmation of Mr. Stommel's theory may answer a question long puzzling oceanographers—why is there no equivalent of the Gulf Stream in the South Atlantic Ocean? The only significant surface current found there is the Brazil Current, which is weak and broad compared with the narrow, swift Gulf Stream.

Mr. Stommel believes a strong subsurface movement will be found under the sluggish Brazil Current. A report on the research appears in the current *Research Reviews* (May), a publication of the Office of Naval Research.

Science News Letter, June 15, 1957

CHEMISTRY

Coffee and Tea Leave Deposit in Blood

➤ COFFEE and tea drinkers can be spotted by a chemical, either caffeine or a closely related substance, found in their blood as much as nine hours later, two scientists report.

The chemical shows up as a spot that absorbs ultraviolet light when blood plasma is extracted by chloroform, then tested by paper chromatographic methods.

Drs. D. Abelson and D. Borcherds of the department of medicine, Postgraduate Medical School of London, England, report their research in *Nature* (June 1).

Science News Letter, June 15, 1957

IN SCIEN

MARINE BIOLOGY

Barnacle Breeding For Better Boat Paint

➤ ARCTIC BARNACLES will breed either faster or slower depending on the temperature, a fact that may help mariners find a better paint for the bottoms of their boats, D. J. Crisp, marine biology station, University of North Wales, Bangor, reports in *Nature* (June 1).

The two types of barnacles tested become fertilized only once a year in their normal environment. But in the laboratory, if they are kept in water at cold temperatures around 43 degrees Fahrenheit, breeding takes place several months before it normally would.

Increasing the temperature to around 60 degrees Fahrenheit has the opposite effect and even the once-a-year breeding time is lost.

When searching for toxic substances to put in barnacle paint, test solutions of them are put in sea water containing barnacle larvae. The test is simple and quick. The only drawback is that a constant supply of barnacles is hard to come by.

But now with the knowledge of temperature effects, it should be possible to make a good supply of the larvae available the year around, the biologist reports.

Science News Letter, June 15, 1957

BIOLOGY

Study Energy Conversion In Luminous Clams

➤ RARE luminous clams from Italy will soon join the common firefly in helping to solve the problem of converting chemical energy to light energy.

Dr. William D. McElroy, biology professor at Johns Hopkins University, Baltimore, has for several years used thousands of fireflies' tails in research directed at discovering how the insects produce their so-called "cold light." Now, with the cooperation of the Naples Experimental Zoological Station, Dr. McElroy hopes to be able to extend his research to include these unique mollusks.

The clam, known scientifically as *Pholas dactylus*, and the firefly each require the two substances, luciferin and luciferase, an enzyme, in order to emit light. In fireflies, the amount of light varies with the amount of a chemical called adenosine triphosphate, or ATP, that combines with the luciferin and luciferase.

ATP is not only important for light emission, however. It is a compound, found in all living things, that enables them to utilize energy.

Science News Letter, June 15, 1957

CE FIELDS

PSYCHOLOGY

Chimp Can Learn to Work Hands Independently

➤ A CHIMPANZEE can learn to use his two hands independently but simultaneously like the boy who pats his head with one hand while he is rubbing his stomach with the other.

This discovery, which makes it possible to use the chimp as an experimental animal for new kinds of behavioral research, is reported in *Science* (May 31) by Dr. C. B. Ferster of the Yerkes Laboratories of Primate Biology, Orange Park, Fla.

The animals used in the experiment were first reduced down to 80% of their normal weight. Then they were taught to press a key to get food. After a fixed number of presses, the animal was rewarded by a morsel of food.

The chimps acted as animals normally do when they work on this sort of "piece-work" pay schedule. They worked at a high, sustained rate except when they were rewarded only after a large number of "pieces." Then they paused after getting their rewards, much like the man who does not show up for work on the day after payday.

Next, a second key was set up about six inches to the left. The chimp worked this key with his left hand while he continued to work the first one with his right—a possibility for the chimp because of his erect posture.

But on the left key, the pay was on the basis of time, not piece work, and the intervals of time varied. The result was a constant, moderate rate of work, quite independent of the rate with the right hand. There were no pauses after the reward.

Food received as pay for work with the left hand was taken and eaten while work with the right hand went on without stopping.

Science News Letter, June 15, 1957

MEDICINE

Test Spots Heart Attack Damage

➤ A MORE SENSITIVE test for detecting heart muscle damage after a "heart attack," called the C-reactive protein test, was reported by Dr. Irving G. Kroop, Jewish Chronic Disease Hospital, Brooklyn, N. Y., and Nathan H. Shackman, State University College of Medicine, Brooklyn, to the American College of Cardiology meeting in Washington.

C-reactive protein is an abnormal serum globulin produced by the body in response to injury or inflammation. It is a highly sensitive index of tissue damage and when there is no other bodily injury it can be used to diagnose cases of heart muscle damage, the cardiologists explained.

Chemical tests are necessary in heart conditions because heart damage will sometimes not show up on an electrocardiograph for weeks.

A comparatively recent development in chemical tests has been the SGO-T, or serum glutamic oxalacetic transaminase test. This substance is an enzyme widely distributed in the body cells but most highly concentrated in heart muscle.

Although the SGO-T test is more specific for heart damage than the new C-reactive protein one, it is not as sensitive as the new one since a varying amount of the enzyme exists normally.

C-reactive protein, on the other hand, is not normally found in the serum and any amount detected is significant.

In 45 cases of milder heart muscle damage the SGO-T test did not show up the damage while the C-reactive protein test did, the cardiologists reported.

Science News Letter, June 15, 1957

BIOLOGY

Male Prostate Cancer Due to Female Hormones

➤ THE FEMALE sex hormone, not the male one, is responsible for both enlargement and cancer of the male prostate gland, Dr. Sheldon C. Sommers, Boston University School of Medicine, has discovered.

This unexpected finding was based on microscopic examinations of the various hormone-producing glands in both men with prostatic cancer and those without any kind of cancer.

Two sets of glands in men, the testes and the adrenals, produce the female hormones, estrogens, as well as male hormones. Female ovaries and adrenals also produce the hormones of both sexes. So far as hormones go, sex is a matter of degree and there is no such thing as 100% maleness or femaleness.

The study showed 80% of the men who had died with prostatic cancer had produced enough estrogen to enlarge their prostates. In most of these cases, the cells producing chiefly male hormone had withered away.

Only about half of the non-cancerous controls showed enlarged prostates, considered a sign of predominant estrogen production.

The results raise the possibility that both enlargement and cancer of the prostate come about because of the same hormonal imbalances.

These imbalances appear to be a product of the aging process, during which male hormone-producing cells were still highly active.

Other scientists have described a "third sex" of old men and women whose glands produce mainly the hormones of the opposite sex.

Dr. Sommer's research was reported by the Massachusetts division of the American Cancer Society.

Science News Letter, June 15, 1957

PHYSIOLOGY

Finger-Sized Structure Controls Brain Function

➤ YOUR AWARENESS of the world and ability to think, learn and act depends upon a tiny structure in your brain no larger than your little finger.

Dr. John D. French, neurosurgeon at the Long Beach Veterans Administration Hospital and the University of California at Los Angeles Medical School, has experimented with a recently discovered tiny nerve network in the brain stem known as the RAS.

Current research at UCLA and other research centers has suggested the RAS is an integrating machine. It awakens the brain to consciosness, keeps it alert and directs the traffic of messages in the nervous system.

The RAS monitors the myriads of stimuli that beat upon our senses, accepting what we need to perceive and rejecting what is irrelevant, says Dr. French. It also tempers and refines our muscular activity.

In addition, it contributes in an important way to the highest mental processes—the focusing of attention, introspection and, doubtless, all forms of reasoning.

It is possible to live for months or even years after injury has destroyed the RAS. But without it, Dr. French points out, an individual is reduced to a blob of protoplasm.

Science News Letter, June 15, 1957

VIROLOGY

Virus Takes Off "Armor," Strips Down for Action

➤ ONCE it has invaded the "fortress" of a living cell, a virus apparently takes off its "armor" and strips down for action.

This has been suggested in tobacco mosaic virus research conducted at the University of California at Los Angeles by Drs. Albert Siegel, William Ginoza and Samuel Wildman.

Tobacco mosaic virus in its native state consists of two substances, a thin strand of nucleic acid, surrounded by a thick mass of protein, Dr. Siegel points out.

Nobody is certain what the function of the protein is, he says. It has been suggested that it may serve as a protective "suit of armor" for the nucleic acid, which is very sensitive and vulnerable to all sorts of factors when it is outside a cell.

Experimentally it is possible to initiate infection with the nucleic acid strand of the virus after the protein coat has been stripped. This "naked" virus starts multiplying sooner in the cell than the complete virus particle.

The investigators believe the cause for this is that the complete virus must "strip" for action after it invades the cell and before it can start multiplying at the expense of the host cell. The process of "stripping" takes about two hours and thus the "naked" virus has a head start over the complete "armored" virus.

Science News Letter, June 15, 1957

GEOPHYSICS

Weather, Oceans and Climate

The atmosphere, a vast ocean of air surrounding the earth, will be probed most intensively during the International Geophysical Year, resulting in improved weather forecasts.

By ANN EWING

➤ THE ATMOSPHERE, a vast ocean of air that supports life on earth, is scheduled to be measured and sampled more thoroughly than ever before during the International Geophysical Year, or IGY, starting July 1.

It is so immense that if each human being on earth could be employed as a weather observer and given an equal chunk of atmosphere to watch, he would be responsible for approximately 2,000,000 tons of air.

Even under the special, world-wide program planned for the IGY, however, far fewer people will be recording the atmosphere's daily changes. And only a relative handful will be charting the seas' currents, temperatures and composition.

One certain result of these measurements of earth's two oceans, one of air and one of water, will be improved weather forecasts. Also expected is a much better understanding of climate, or long-term weather, and the part the world's seas play in storing the sun's heat.

Measuring the Ocean's Circulation

Water, in liquid or solid form, covers about four-fifths of the earth's surface. Some 70 ships from 30 countries will sail the oceans during IGY. Next to climate and the earth's heat balance, probably the most important problem the scientists on the ships hope to solve is the circulation of the oceans' deep water.

An answer to the question of how fast deep water rises to the surface must be found before oceans can be used as dumping grounds for atomic wastes. The peaceful development of atomic energy is expected to result in radioactive waste products equal to the explosion of somewhere between 10 and 100,000 hydrogen bombs a year.

The oceans would be ideal for storing this "hot garbage" if it could be done without harming fisheries or other resources of the sea, and without radiation damage to bathers. The wastes would have to be dumped in deep water that would remain at great depths until the radiation level was within safe limits.

The oceans and the air can be considered two parts of a planetary heat engine. The earth receives almost all of its energy from the sun, in all sorts of radiations from long-wave heat radiation to very short-wave ultraviolet. In the atmosphere, the heat energy from the sun is turned into mechanical motion, the shifting of cold and warmer air masses resulting in the winds.

In the oceans, water is warmed by sunlight in the tropics and cooled by melting ice and snow in the polar regions. Cold water near the poles sinks and flows along the bottom of the great oceanic basins toward the equator, where it displaces warmer water, but the changeover speed is unknown.

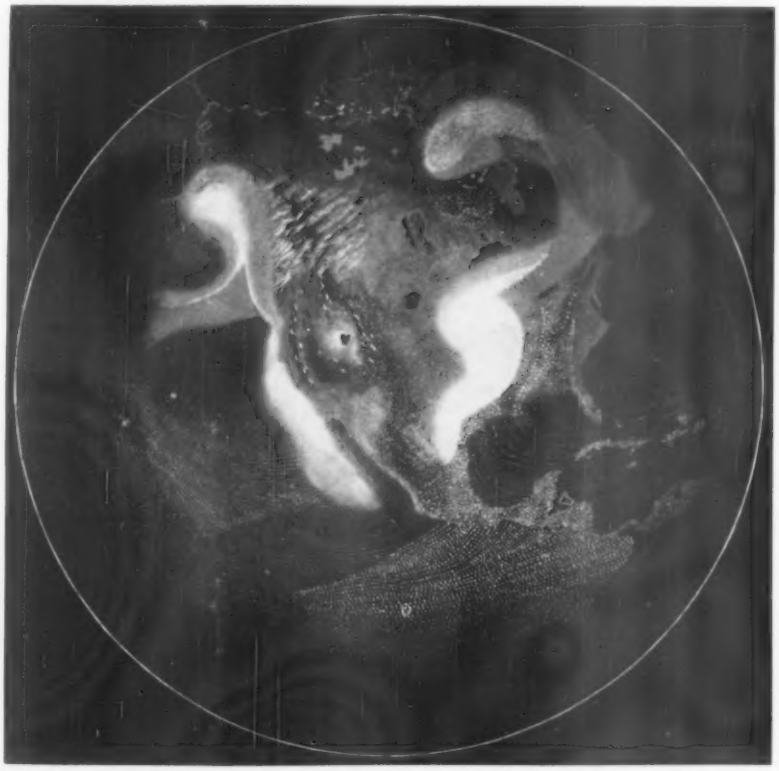
The oceans' fish and other marine life are one of a great, almost untapped natural resource. The fish population near Peru, for instance, is so large that the guano birds there catch about 3,000,000 tons of fish a year, almost as much as the entire Japanese fisheries. How oceanic currents affect sea life is one of the many subjects for study.

To learn about atmospheric circulation, one new method will be tested during IGY—charting the natural and artificial radioactivity in the air. This program looks at fallout in reverse, considering the radioactive particles as tracers for the world's circulation patterns.

There are six natural radioactive elements in the atmosphere. These include beryllium, carbon, two forms of phosphorus, sulfur, and tritium, the triple-weight hydrogen that results from cosmic ray bombardment of air or is produced in certain hydrogen bomb tests.

The total amount of tritium in the entire atmosphere is only about two pounds, but modern chemical methods are so sensitive the tritium in a small sample of water can be measured. Previous tests have shown there is about ten times as much tritium as expected in air, suggesting that the sun is blowing tritium into our atmosphere. It may also be hurling helium and perhaps other radioactive particles at the earth.

The problem of determining what differ-



U. S. WEATHER FROM 4,000 MILES—How a black-and-white television picture of the earth's weather might look from a satellite 4,000 miles above Amarillo, Texas, on a June 21 is shown in this U. S. Weather Bureau drawing. A cyclonic storm covers much of central United States.

ent kinds of particles are coming into the atmosphere will be attacked by a combined effort of meteorologists, oceanographers and upper air physicists. Experiments from the satellite will be included.

Glaciers, Frozen Libraries

A library of past atmospheric events is frozen in glaciers. By taking borings and studying the dust and chemical composition of various layers, scientists hope to learn what has happened to the earth over the past 1,000 years or more.

Glaciers cover about ten percent of the world's land area, and in the past have covered up to three times this area. How fast they form and how rapidly they disappear is one of the problems to be studied.

Scientists hope also to learn whether glaciers are now receding or growing.

Slow-growing lichens found right next to the ice in Antarctica indicates there probably has not been a recession in Queen Maud Land in many years, but conclusive proof is needed. Some of the glaciers on the white continent are 10,000 feet deep, and probably took 5,000 years to form.

The glaciological studies will also help to establish the earth's heat balance more accurately.

One factor affecting the heat balance is the amount of carbon dioxide in the atmosphere, and this will be measured for clues concerning whether or not the world is warming up. Reports indicate the carbon dioxide content of air has increased 10% in the last 50 years.

An increase of 20% would result in a considerable change in climate — northern cities would become warmer, for instance, and rainfall patterns could make deserts of southern California and a good part of Texas.

All these measurements, and many more, to be made during IGY will contribute to man's knowledge of his environment. (See SNL, June 8, p. 362.)

Meteorological Investigations

Extra effort will be exerted on specified days, known as world meteorological intervals, to take particular measurements. These intervals are a series of ten consecutive days each three months, including the solstice or equinox day.

Upper air soundings will be increased and special attention will be given to reaching extra high altitudes at that time. Most of the rocket launchings planned for the IGY are scheduled for these ten-day intervals.

Although there are thousands of meteorological stations scattered throughout the world, most of them take only surface observations and are mainly clustered within inhabited regions. Only a few hundred take vertical soundings that reveal the true three-dimensional structure of the earth's atmosphere.

Because it is impossible, even with the combined resources of all 70 nations participating officially or unofficially in IGY, to fill in all the immense gaps in the weather observation network, particularly over the oceans, the Arctic and most of the Southern Hemisphere, attention is being concentrated on several pole-to-pole lines of upper air meteorological stations.

These lines are located at 70 to 80 degrees west, 10 degrees east, 75 degrees east and 140 degrees east. To complete the southern positions of these lines, new stations were built where necessary.

In addition a complete surface and upper air meteorological program has been set up in the Antarctic, making possible for the first time a thorough exploration of weather there.

The United States runs the Antarctica Weather Central, distributing information to all nations with bases there.

Besides obtaining measurements in areas heretofore unexplored, special readings will be made of the amount of ozone in the vertical air column overhead. Although the ozone content is exceedingly minute, its presence is essential because it shields life from the destructive effects of certain ultraviolet radiations.

Ozone can also serve as a "tracer" for meteorological motions, both vertically and horizontally.

The emphasis on obtaining meteorological data from high levels of the atmosphere will shed further light on the origin and location of the high-speed, narrow rivers of air known as the jet stream. These wind systems, because of their swiftness, are assuming great importance in aircraft navigation and design.

The major pole-to-pole chains form a kind of coordinate system by which the movement of atmospheric disturbances of all kinds can be observed and mapped.

One undoubted outcome of the many measurements during IGY will be improved weather forecasting.

Science News Letter, June 15, 1957

ANTHROPOLOGY

Women Carry Their Fat Outside Their Frames

➤ THE WEIGHT of fat is about the same on men as on women, but the women carry more on the outside of their frames, Dr. Stanley M. Garn, anthropologist of the Fels Research Institute, Antioch College, Yellow Springs, Ohio, reports in *Science* (May 31).

Measurements of fat were made on 107 healthy women aged from 20 to 60 and compared with measurements on 81 men of equal age range. This was done by picking up the rolls of fat that can be picked up on various parts of the body, such as the famous "inner tube" around the waist, and measuring them. Out of nine sites measured, the fat rolls were larger on women for all but two.

When, however, the weight of the body fat in proportion to total body weight was estimated, it was not markedly different for the two sexes.

Science News Letter, June 15, 1957

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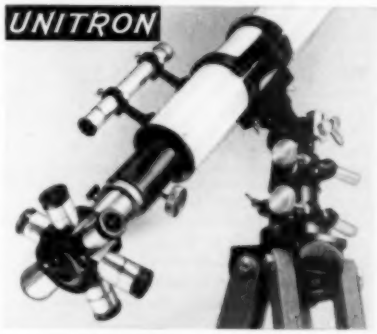

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• Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

THE AMATEUR ASTRONOMER—Patrick Moore—*Norton,* 337 p., illus., $4.50. A book by a British astronomer for the beginner who is anxious to make a start with what equipment he can collect at limited cost.

BENJAMIN FRANKLIN'S UNFINISHED BUSINESS: Story of the International Celebration of the 250th Anniversary of the Birth of Benjamin Franklin, 1706-1956—Helen and Clarence Jordan, Eds.—*Franklin Institute,* 315 p., illus., $4.00. Bringing together the efforts of scientists over the world to carry out the ideas of Franklin and to spread his ideals to the peoples of the world in the anniversary year of 1956.

CALIFORNIA WASPS OF THE GENUS OXYBELUS (Hymenoptera: Sphecidæ, Crabroninæ)—Richard M. Bohart and Evert I. Schlinger—*University of California Press,* Bulletin of the California Insect Survey, Volume 4, No. 4, 32 p., 16 pl., paper, 75 cents. This rare wasp is of economic importance because it preys on disease-carrying and agricultural insects.

CHECKLIST OF THE COLEOPTEROUS INSECTS OF MEXICO, CENTRAL AMERICA, THE WEST INDIES, AND SOUTH AMERICA: Part 6—Richard E. Blackwelder—*Govt. Printing Office,* Smithsonian Institution, U. S. National Museum Bulletin 185, 566 p., paper, $2.25. A bibliography of all papers published before 1946.

COLLEGE PHYSICS—Robert T. Beyer and A. O. Williams Jr.—*Prentice-Hall,* 660 p., illus., $7.50. Text for a one-year liberal arts course in general physics.

CONCEPTS OF FORCE: A Study in the Foundations of Dynamics—Max Jammer—*Harvard University Press,* 269 p., diagrams, $5.50. Intended to clarify the role of force in classical as well as in modern physics.

CORONARY HEART DISEASE: Angina Pectoris; Myocardial Infarction—Milton Plotz, foreword by William Dock—*Hoeber-Harper,* 353 p., illus., $12.00. Oriented for clinical use, this book gives the physician all the newest therapy and diagnostic aids.

THE EARLY DETECTION AND PREVENTION OF DISEASE—John P. Hubbard, Ed.—*McGraw-Hill,* 350 p., $7.50. A selection taken from the proceedings of a post-graduate course conducted by the American College of Physicians.

EPILEPSY: Grand Mal, Petit Mal, Convulsions—Letitia Fairfield—*Philosophical Library,* 159 p., illus., $4.75. A non-technical book for the patient, family, teacher or social worker.

GALACTIC NEBULAE AND INTERSTELLAR MATTER—Jean Dufay, translated by A. J. Pomerans—*Philosophical Library,* 352 p., illus., $15.00. The diffuse matter between the stars of the Milky Way constitutes as much as half the total mass of our galaxy. One way its presence is revealed is by its effects on the light of the stars.

HEALTH YEARBOOK 1956—Oliver E. Byrd, Compiler—*Stanford University Press,* 278 p., $5.00. A selection of 254 articles from 78 different periodicals or special reports.

HUMAN PROBLEMS OF A STATE MENTAL HOSPITAL—Ivan Belknap—*McGraw-Hill,* 277 p., diagrams, $5.50. It is revealed here that most professional psychiatrists will not work in the state hospital. In the state hospital studied, none of the ward physicians was a Board-certified psychiatrist. The abandonment of state hospitals and substitution of decentralized psychiatric treatment in the patient's own community is recommended.

LIGHT, VEGETATION AND CHLOROPHYLL — J. Terrien, G. Truffaut and J. Carles, translated by Madge E. Thompson—*Philosophical Library,* 228 p., diagrams, $6.00. Discussing the effect of light on vegetation and the production of energy.

MANUAL OF RADIATION THERAPY—K. Wilhelm Stenstrom. Collected by John B. Coleman—*Charles C. Thomas,* rev. ed., with additions and discussions by Paul C. Olfelt and Frances Conklin, 94 p., diagrams, $4.50. Bringing the techniques up to date and adding a new resume on underlying principles.

ORGANIC CHEMISTRY — H. Harry Szmant — *Prentice-Hall,* 803 p., diagrams, $7.95. A guide for the beginner with emphasis on the theoretical and industrial aspects of organic chemistry.

PILOT PLANTS, MODELS, AND SCALE-UP METHODS IN CHEMICAL ENGINEERING—Robert Edgeworth Johnstone and Meredith Wooldridge Thring—*McGraw-Hill,* 307 p., diagrams and graphs, $9.50. An attempt to systematize and present in a usable form such quantitative methods as are available for predicting the performance of a large-scale process plant from small-scale operation.

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PROCEEDINGS OF THE SRE-OMRE FORUM—W. E. Parkins and others—*Atomics International*, 313 p., illus., paper, $1.50. To help industrial, municipal and other groups to keep currently informed on the status of the civilian nuclear power program.

RADIO AIDS TO AIR NAVIGATION—J. H. H. Grover with a foreword by Peter G. Masefield—*Philosophical Library*, 138 p., illus., $6.00. A comprehensive survey of civil radio air navigation systems.

ROLE RELATIONS IN THE MENTAL HEALTH PROFESSIONS—Alvin Zander, Arthur R. Cohen and Ezra Stotland with the collaboration of Bernard Hymovitch and Otto Riedl—*University of Michigan*, (Institute for Social Research), Research Center for Group Dynamics, 211 p., $4.50. A scientific study of how psychiatrist, psychologist and social worker get along together on the job.

THEY FOUGHT FOR THE SKY: The Dramatic Story of the First War in the Air—Quentin Reynolds—*Rinehart*, 304 p., illus., $3.95. The story of the gallant hand-to-hand fighting when battle first took to the air.

THINKING BY MACHINE: A Study of Cybernetics—Pierre de Latil, translated by Y. M. Golla, with a foreword by Isaac Asimov—*Houghton Mifflin*, 355 p., illus., $5.50. The author indicates that just as one machine can take over the routine functions of human muscle, so another machine can take over the routine uses of the human mind. Thus the mind is left more free for creative work.

TREATMENT OF THE CHILD IN EMOTIONAL CONFLICT—Hyman S. Lippman—*McGraw-Hill*, 298 p., $6.00. All children are subject to anxiety and irrational fears. Those seen at a clinic are those for whom parental love was not enough to ease their apprehension. This book tells what the clinic can do for the suffering child and his anxious parents.

WORLD AVIATION DIRECTORY: Listing Aviation Companies and Officials, Spring-Summer 1957—Marion E. Grambow and Harry Thayer, Eds.—*American Aviation Publications*, 993 p., paper, $9.00 plus postage.

Science News Letter, June 15, 1957

TECHNOLOGY

Modern Center Devoted To Petroleum Research

➤ THREE NEW laboratories devoted to research on oil drilling, field and refinery production, and improvements of and new uses for petroleum products have been dedicated near Pittsburgh.

The laboratories are part of the research center of Gulf Oil Corporation at Harmarville, Pa. They feature an 80-foot drilling derrick rising through the roof of one building, 20 room-size engine test cells for measuring oil product performance factors, a 3,000,000 volt Van De Graaff particle accelerator for X-ray investigations, and facilities for radioactive tracer studies.

Science News Letter, June 15, 1957

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Dateline: AMA, New York

(Continued from page 371)

➤ A POTENT eye-drop solution to control glaucoma, an eye disease causing intense pain and blindness if left untreated, was reported by Drs. Irving H. Leopold, David Gold and Paul Gold, Wills Eye Hospital, Philadelphia, to the AMA meeting.

The drug, technically known as phospholine iodide, is effective in many cases of glaucoma not helped with present drugs, and can also reduce the frequency of treatments needed with the older solutions.

Glaucoma is estimated to affect approximately three percent of all adults over 40 years old and results from increased pressure in the fluid circulating in the eye between the cornea and the iris. The pressure increases because the fluid is unable to escape through its normal channels and backs up, causing intense pain and eventual blindness. The new drug reopens these channels by chemical action and allows the pressure to return to normal.

It has been tested in 101 affected eyes and successfully controlled the condition in 73 of them. Although 25 cases were recorded as failures, in 12 of them the pressure was controlled but the drug was discontinued because of bad side effects.

These included brow aches, dimness of vision, an unusual rise in pressure in two cases, and nausea in one.

The phospholine iodide controlled 42 cases that had not been helped with currently used solutions. In those that had been helped before, less frequent applications of the new drug were needed.

The drug is longer lasting than other commonly used ones and is water soluble, which adds to its applicability. Other comparable drugs now used have to be dissolved in peanut oil to retain their potency.

Headaches and Education

➤ HEADACHES are the price of education, Dr. Henry D. Ogden of Louisiana State University School of Medicine reported to the Medical Association.

In a survey covering over 4,000 individuals from various occupations and backgrounds, 80% of the students questioned reported having headaches. In the next highest category, that of executives, 77% reported having them. Then in descending order came professional people, housewives, clerical workers, salesmen and manual laborers.

Farmers and other agricultural workers were on the low end of the scale, with only 50% of them reporting headaches.

More than half the general population have headaches, with women getting more of them than men, the survey showed. Youngsters evidently have more headaches than oldsters, too, with 78% of those under 20 reporting them, while only 28% of those over 60 reported them.

The figures also showed single persons suffer most, while the widowed suffer the least.

Factors that make a person susceptible to headaches include advanced education, an unmarried state and heredity. Factors that actually trigger off the discomfort may include temperature changes, sex tension, hunger or excessive smoking.

Science News Letter, June 15, 1957

YOUR HAIR and Its Care

By Oscar L. Levin, M.D. and Howard T. Behrman, M.D.

If you want healthy hair, lovely hair, then you need the expert advice in this book.

Two medical specialists have here pooled their knowledge to give you in plain language the up-to-date scientific facts now available about hair. They tell you what to do (and what not!) to save and beautify your hair, stimulate healthier hair growth, and deal with many problems, common and uncommon, as:
Dandruff—gray hair—thinning hair—care of the scalp—baldness—abnormal types of hair—excessive oiliness—brittle dryness—hair falling out—infection—parasites—hair hygiene, etc., etc.

Medical science is better equipped today than ever before to prevent trouble above the hair line; or, should some difficulty already have arisen, to deal effectively with it.

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Do You Know?

A new coating for *aircraft windshields* has a low electrical resistance and conducts an electric current to heat the glass, melting ice and dissipating fog.

It is estimated the U. S. will have at least *230,000,000 people* by 1975.

Yellow fever virus has been progressing northward toward the U. S., averaging 13 miles per month; during 1956 it reached Guatemala.

The peoples of the *USSR* speak no less than 85 languages.

Questions

AGRICULTURE—What plant was used to test the new gibberellin-like substances? p. 373.

□ □ □

GEOPHYSICS—How much tritium is there in the atmosphere? p. 378.

□ □ □

MEDICINE—When does the body produce C-reactive protein? p. 377.

□ □ □

METEOROLOGY—How can cloud-seeding decrease the number of lightning-caused forest fires? p. 373.

□ □ □

OCEANOGRAPHY—Where is the new ocean stream located? p. 376.

□ □ □

Photographs: Cover, Arthur Scholes; p. 371, American Medical Association; p. 373, U. S. Department of Agriculture; p. 375, U. S. Weather Bureau; p. 384, E. I. DuPont de Nemours & Co.

● RADIO

Saturday, June 22, 1957, 1:45-2:00 p.m., EDT.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Leone N. Claman, attending physician, in charge of allergy, New York Infirmary, will discuss "Allergies."

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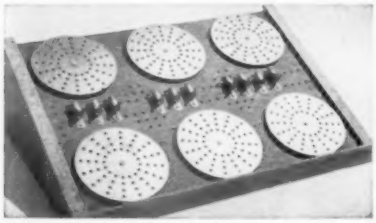

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TRAVEL SHAVING DEVICES operate from automobile power sources. One draws power through the car radio, can be installed easily, fits all cars and operates all AC/DC electric shavers. The other is a shaver that plugs into the cigarette lighter.

Science News Letter, June 15, 1957

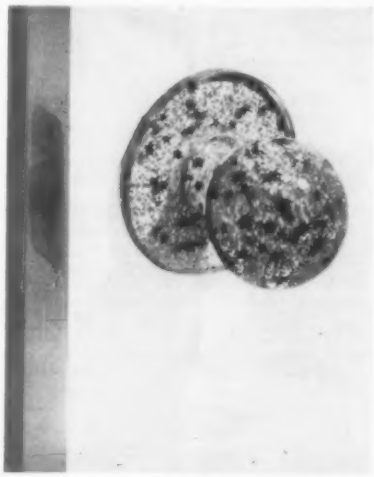
BARBECUE GRILL can be built into a cabinet or counter top or used in other indoor or outdoor installations. Available in two models, the barbecue has a stainless steel top and a heavy steel fire pan that is moved up or down by a crank. The units are portable.

Science News Letter, June 15, 1957

EXPOSURE DIALER for photograph fans gives the correct exposures for day or night. Good for any film, the dial is an all-metal disc with a ready reference chart of film speeds and guide numbers. All settings are designed for direct reading.

Science News Letter, June 15, 1957

DOOR KNOBS for decorating the home are molded from an acrylic resin. The material can be molded in a wide range of shapes and colors, or even embedded with metallic flakes as shown in the photograph. The knobs do not tarnish and are non-conductors of electricity.



Science News Letter, June 15, 1957

STEEL NAILER is described as driving nails where a hammer cannot. A clip holds the nail in an exact position while the plunger stroke drives it in. The nine-inch long nailer is 7/8 inch in diameter. It can be used for brads, nails or spikes.

Science News Letter, June 15, 1957

WINDOW WASHER can be used to wash the outside of windows from inside the house. The cleaner, which can be bent to get at corners and edges, dries windows too.

Science News Letter, June 15, 1957

MINIATURE GOLF COURSE can be set up in the backyard. Steel-shafted clubs, balls and a variety of obstacles are provided. The course can be had in a five-hole set or a nine-hole set. Putting cups and hole markers are also provided.

Science News Letter, June 15, 1957

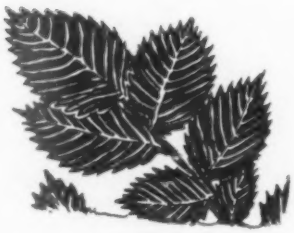
BURGLAR-PROOF LOCK allows homeowners to leave their windows partially open at top or bottom, or both, yet securely locked. Easily installed, the metal locking device fits any standard size wooden frame window.

Science News Letter, June 15, 1957

Nature Ramblings

By HORACE LOFTIN

Elm Enemy



➤ MANY A CITY dweller, thinking back to childhood days in the little home town, remembers best of all the rows of white elms that made a solid green archway over the narrow streets. To many of us, these lovely elms, *Ulmus americana*, typify the best in small-town America, the "home town."

But a trip back to the home town now might sadden our city dweller, for he may find the elms gone, or at best their ranks thinned and battered.

Sometime prior to 1930, a destructive fungus disease appeared in Europe, making its effects especially felt on the elms which helped to hold together the dikes of Holland. American plant quarantine officers kept a stern watch to see that this Dutch elm disease did not slip into this country.

In spite of their efforts, the fungus disease erupted in Ohio in 1930. Attempts were made to wipe it out there, but three years later 3,800 infected elms were found in New Jersey and others in Connecticut. Thereafter, each year found it spreading into new areas of the country.

The source of infection was finally determined. English elm logs, imported into this country to make veneer, were found to be highly infested with the elm bark beetle, *Scolytus multistriatus*. These beetles, in turn, were found to be the carriers of the Dutch elm disease fungus, *Graphium ulmi*. When the disease-bearing insect once enters a living elm, there is no effective remedy beyond felling and burning the tree.

Due to the Dutch elm disease invasion, many of the finest stands of white elm have disappeared and countless American streets have lost their green cover.

A tree infested with the elm bark beetle will show scattered holes where the larvae have bored through the bark. Under the bark, the channels where the larvae move about can be seen. The fungus makes itself known by crooking of the twigs and by falling of the leaves during the growing season. In winter, dead leaves may remain on the tips of branches. Death of the tree is a matter of time only.

Many tree diseases may show similar symptoms. It is wise to seek expert advice if you suspect Dutch elm disease in your neighborhood.

Science News Letter, June 15, 1957